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THE "ROUNABOUT PROCESS" IN THE INTEREST THEORY.

SECT. 1. THE NATURE OF THE INTEREST PROBLEM.

Professor Eugene von Böhm-Bawerk's critique* of the older interest theories marks a new era in economic thought. The highest point attained in his more positive discussion is his statement of the real nature of the interest problem, as that of the exchange of present goods against future goods. This thought was an inspirational break with the past, and was charged with possibilities for the future of economic theory.

Nevertheless, Böhm-Bawerk has failed to formulate a consistent and satisfactory theory of interest. A statement of the nature of the problem and a solution of it are not the same. The English translator implies his belief that they are when he calls this statement "the essence" of "Böhm-Bawerk's theory of interest" †; the author likewise appears to identify the two when, in his *Positive Theory*,‡ he says: "Present goods are, as a rule, worth more than future goods of like kind and number. § . . This proposition is the kernel and centre of the interest theory which I have to present." This, however, is but the fact which the interest theory is to explain logically. The proposition is not open to question: it is a novel, but unquestionably better, way of stating the nature of the problem. Explanations may differ after the nature of the problem is well agreed upon. Böhm-Bawerk shows not only in manifold expressions, but by devoting several hundred pages to setting forth his theory of interest,

* *Capital und Capitalzins*, Innsbruck, 1884. The second edition, Innsbruck, 1900, is reviewed by F. A. F. in the *Journal of Political Economy*, January, 1902. The English translation of the first edition, cited in this article, bears the title *Capital and Interest*.

† *Capital and Interest*, preface, p. xix, referring to text pp. 257-259.

‡ *Positive Theory of Capital*, p. 237.

§ The last five words, if taken in a literal and objective sense, are open to criticism. See my discussion in the *Quarterly Journal of Economics*, vol. xv. p. 8.

that he does not consider his work done when the proposition above quoted is stated. He adds immediately: "The first part of our explanation (Book V.) will try to prove the truth of the proposition." * What he does, however, is to give his peculiar explanation of the causes for this fact. The truth of the original proposition cannot be invoked as a proof of any one theory to explain it. The conception of the interest problem as one aspect of exchange value must be considered merely as preliminary to the formulation of an interest theory, not as the theory itself.

SECT. 2. THE ROUNDABOUT PROCESS AND THE PRODUCTIVITY OF CAPITAL.

It is our purpose here to consider only one of the three principal features of Böhm-Bawerk's explanation "why present goods are, as a rule, worth more than future goods"; but that one is the most important. It is the technical superiority of present goods as instruments of production when used in "roundabout" processes.† He repeatedly refers to this as "the most fundamental conception in the theory of capital,"‡ as "the chief pillar,"§ and as "the empirical corner-stone" of his theory. He has recently offered an elaborate defence and restatement of it.||

Again, we shall narrow our discussion to one only of the three supports¶ offered for the proposition that roundabout processes are more productive than direct ones; that is, its

* *Positive Theory*, p. 237.

† *Ibid.*, p. 260. The other reasons given are: (1) differences in want and provision in present and future (*Positive Theory*, p. 249); and (2) underestimate of the future (*Positive Theory*, p. 253).

‡ *Positive Theory*, p. 22. § *Ibid.*, p. 264.

|| *Einige strittige Fragen der Capitalstheorie*, Wien u. Leipzig, 1900. Published first as three articles in the *Zeitschrift für Volkswirtschaft, Socialpolitik, und Verwaltung*, in 1899. Reviewed by F. A. F. in the *Political Science Quarterly*, vol. xvii. pp. 169-173, March, 1902.

¶ The first explanation Böhm-Bawerk offers is an appeal to practical examples. It can easily be shown that he wavers greatly in his thought and statement of the degree of validity in the proposition. See, e.g., *Positive Theory*, pp. 20, 22, 82, 84, 260; *Einige strittige Fragen*, pp. 39, 40. The second reason given to account for the greater productiveness of roundabout methods is that thereby natural forces are enlisted in the service of man. *Positive Theory*, pp. 12-33; *Einige strittige Fragen*, p. 10. This second reason is open to the criticism to be given in discussing the third (see below, p. 169); and the two will stand or fall together.

agreement with the old proposition that "capital is productive." This proposition is so generally accepted that, if the two propositions can be shown to be identical in thought, differing merely in expression, his thesis, so Böhm-Bawerk declares, is established. The main purpose of the author is to prove that a more roundabout process means identically the same as production with "more capital." If he can show that the two propositions are interchangeable, he will gain for the one all of the authority and belief that attaches to the other among economic students.

It may enable the reader to see a unity in the various criticisms that are to follow: it may serve to show that the negative views expressed proceed not from a spirit of captiousness but from a somewhat positive conception of the nature of the solution, if at this point is indicated the standpoint from which our discussion proceeds. We must demand of the theorist dealing with capital and interest (1) that the term "capital" be used consistently in the various stages of his argument, and (2) that the fundamental explanation apply to interest wherever it is manifest and in all its forms. On another occasion I have given reasons for the belief that in these respects Böhm-Bawerk is at fault.* In the following discussion these tests are applied to the particular question in hand.

If it be allowable to epitomize many pages of the author's argument into a single syllogism, it would run thus:—

First premise: The proposition that capital is productive (which means that, the more capitalistic agents † labor has, the more productive it is) is unquestionable.

Second premise, first link: More capital means identically the same as a longer production period; second link: A longer production period means the same as a more roundabout process.

Conclusion: Therefore the statement that the roundabout process is more productive is unquestionable.

Böhm-Bawerk does not deem it necessary to labor long to prove the general proposition that capital is productive. He

* *Quarterly Journal of Economics*, vol. xv. pp. 1-45.

† These words occur in *Einige strittige Fragen*, p. 11.

first states the proposition in this form:* "Labor is more productive according as it is equipped with more capitalistic agents." This may suggest the idea of a greater number or quantity of agents, physically considered; but he immediately uses in his illustration the value expression of capital in these words: "National labor yields more when supported by a capital of five hundred florins per head than without any capital at all, and yields still more when the capital is five thousand florins or ten thousand florins per head." The implication, here as elsewhere, is that, while this increase may not be in exact proportion to, it is some function of, the increase of capital. So much depends on the sense in which the word "capital" is used that we must examine its meaning in this connection.

"More capitalistic agents" evidently tend to more technical production. Two spades, two fields, two ploughs, in place of one, and perfect tools in place of crude ones, mean a more bountifully endowed world to work in; and, while an increase of one particular kind of agent may sometimes burden rather than aid industry, the possibility of adjusting and interchanging the supply of different agents makes the proposition a valid one in general. But, when one passes over to the value expression of capital, the nature of the statement as an abstract theoretical proposition changes; for, unless we are assured that the greater value expression at the later period stands for a greater number or better quality of physical agents, the technical productivity may vary in any conceivable degree or direction, becoming even absolutely less with the greater amount of capital. The two concepts, it is true, would be the same in practice if we were speaking of the increase of capital applied to a particular industry at a given moment in which there was no change in the supply of capital in the community. But Böhm-Bawerk has chosen to discuss, not the greater roundaboutness of production in a particular industry to which more capital is applied, but the greater roundaboutness in industry as a whole where the value expression of capital has increased. That is, he discusses not the case of a

* *Einige strittige Fragen*, p. 11: "Die Arbeit desto productiver ist, mit je mehr capitalistischen Hilfsmitteln sie ausgerüstet ist."

static supply of capital as a whole, but that of a changing supply of capital, the change being measured by the value expression. The conclusion he draws, therefore, is not theoretically sound; for there is no certainty or even probability that the two features of effectiveness and value will vary at the same rate, or, in the extreme case, that more "capital," containing a larger element of various scarcity values, will represent productive agents even as great or (technically) as effective as those of smaller value did in the preceding period.

Regarding the second premise, first link, Böhm-Bawerk must show that the longer production period is identical with the use of "more capital." Let us examine his concept of capital in this immediate connection.*

Böhm-Bawerk answers the question "What is capital?" not by using either of the definitions referred to in the last paragraph, but by a figure of speech intended to direct attention to what it has been and to the source of its value. "Previous labor," he says, "is a rough but essentially true definition." But he adds in a note, "It is more exact to say, stored-up, previously applied productive force, which can be not only labor, but also valuable natural forces or uses of land."† Then, returning to the text: "a small capital evidently represents little previous labor, a large capital much. A capital of fifty florins can represent, in the extremest case, one-sixth of a labor year when the common wage is three hundred florins a year," etc. This comes near to the discredited labor value theory; and the author, seeing the difficulty, adds in a note: "Probably considerably less, because on the one hand comes into play a higher paid quality of labor, and on the other the value of the stock of capital goods cannot by any means be resolved into labor or wages respectively, but contains for a considerable part accumulated interest, profits, monopoly gains, and the

* This modifying phrase is needed, as there are several different conceptions of capital used by Böhm-Bawerk. See "Recent Discussion of the Capital Concept," *Quarterly Journal of Economics*, vol. xv. pp. 8, 40.

† *Einige strittige Fragen*, p. 11: "Was ist denn eigentlich das 'Capital'? Es ist, wie es mit einer zwar nicht ganz schulgerechten aber wenigstens im Groben recht zutreffenden Definition bezeichnet zu werden pflegt, 'vorgethane Arbeit'". The note reads: "Genauer ist es zu sagen, aufgespeicherte, vorgeschossene Produktivkraft, die nicht nur Arbeit, sondern auch wertvolle Naturkraft oder Bodennutzung sein kann."

like.”* Despite these important alterations in the meaning of the term “capital” the author has gone on to use it in the simpler, unmodified form, drawing, as to the nature and effect of capital as a whole, conclusions which at the most can be true of that part of capital reducible to terms of previous labor. This conception of capital is confusing by reason of its attempt at a simplicity that is untrue to the facts. It must be noted, however, that it is a value concept of capital. The capital embodies a value which it derives from the value of the labor that has produced it (sometimes thought of together with the value of all the other factors admitted in the note above quoted). It is a value concept despite the use of the terms “labor-month” and “labor-year”; for the labor can be spoken of as representing a certain fraction of the value of the capital only after the amount of the labor itself has been expressed in terms of value, not of time.

In attempting to show the identity of the thoughts of a longer period of production and a more roundabout process (second link of second premise), he says that the ripe consumption goods needed within the year will be secured by a union of new labor with the old labor in the form of capital. It is evident to him that, when little old labor is present, the new labor must be in large proportion, and the average production period † must be short, and *vice versa*.* “The mass of existing capital shows how many labor-months are on their way at any one time, have been performed as labor, and have not yet arrived at the goal of ripened enjoyment. If now, with a capital of fifty florins per head, no more than two labor-months are on their way at one time, it indicates, in an unmistakable way, a shorter average duration of the roundabout method adopted than when, with a mass of capital ten or a hundred fold greater, twenty or two hundred labor-months at once are in the transition stage of unripe intermediate product.” This being

* *Einige strittige Fragen*, p. 12.

† The “production period” with Böhm-Bawerk means not the entire time elapsing from the first labor applied to goods, but the average time from the embarking of labor in products until its emergence as enjoyable goods, the whole produced value being thought of as ultimately consumed. This is carefully restated by the author in *Einige strittige Fragen*, pp. 4, 5. Misunderstanding on this point has led to most of the criticisms to which Böhm-Bawerk has replied. We must recognize also that Böhm-Bawerk uses the conception of the production period as that of the average for all industry.

to Böhm-Bawerk quite "evident," he believes that production with the aid of more capital is identical with the lengthening of the average production period, and hence with the adoption of a more roundabout method of production.*

SECT. 3. FAILURE OF THE ARGUMENT TO IDENTIFY INCREASE OF CAPITAL AND ROUNDABOUTNESS.

We must, for several reasons, question the argument by which are thus identified the thoughts of a larger capital, a longer production period, a more roundabout process, and a greater productiveness. First, in Böhm-Bawerk's concept the natural agents are not a part of capital; and, unless the natural agents, the fertile soil and natural forces, are as great per capita, the technical productiveness of the larger capital may be less than before. His conclusion, therefore, would hold good at most with the added proviso: the amount and effectiveness of natural agents increasing proportionally. In an extreme case conceivable the greater supply of capital (however measured) might be more than offset in its technical effect by a smaller per capita equipment of natural agents.

Secondly, the argument contains the fallacy of the vicious circle by implying the rate of interest. With a value concept the "amount of capital" corresponding to a given product each year varies with the rate of discount in capitalization.† If the prevailing interest is at 20 per cent., an annual product valued at 10 supports a capitalization of fifty; but, if the interest falls to 1 per cent., the same product supports five hundred. Of the two parts of the proposition that more capital means a greater productivity and a more roundabout process, the first portion, therefore, is unsound unless it be qualified by the phrase: provided that the rate of interest has remained the same. But it is the change of the rate of interest which he is attempting to explain through a change in the technical productiveness.

* *Einige strittige Fragen*, p. 11.

† It may seem that this is not true of Böhm-Bawerk's concept of capital, as he has defined it in terms of concrete things and not according to its money expression. Yet as in this very passage he has employed the money expression, and as the discussion of "units" of capital is impossible without violating his definition, it is permissible to cite this against him.

Thirdly, the argument is unsound in the degree to which the capital contains accumulated interest or monopoly gains. It sounds plausible to say that, if the capital per head represents a value one-sixth the average value of a year's labor, the process is one-sixth as roundabout, and the production period is one-sixth as long, as if the capital were just equal in value to a year's labor. But this is an entirely hypothetical proposition, whose truth depends on the fact assumed in the "if"; and the author himself has hastened to add that a considerable part of the value of the capital is due to other elements, among them accumulated interest.* If the value of the capital always can be traced back to labor, and two amounts of capital are proportionate to the labor that has been put into them, then, on an average, the length of the production period would be the quotient of the value of the capital divided by the value of a year's labor. But every unit of capital that represents the other sources of capital disturbs and falsifies that relation. If one hundred and fifty of the three hundred florins capital consists of accumulated interest, the capital represents a production period of only one-half of a year: if two hundred and fifty florins so consists, the production period would be only one-sixth of a year, the same as if capital were only fifty florins, all due to labor.† The proposition in question will be true, therefore, only with a third proviso reading thus: an increase of capital is identical with a more roundabout process, provided that the increase represents labor only, and not accumulated interest or monopoly gains.

A fourth objection to the argument is that, in admitting the value of the uses of land into the value of the stock of capital, Böhm-Bawerk has given a blow that wrecks the capital

* *Einige strittige Fragen*, note, p. 12.

† One can imagine the reply that the greater proportion of interest is the result, and expresses the lengthening, of the period of production; but this fails to explain profits and monopoly gain. It is shifting entirely the test by which the length of a period is to be measured; for, if only one-sixth of the results of the year's labor is at any time bound up in the form of capital, evidently five-sixths of it are applied to current uses, are on an average consumed at once, and only two months elapse on an average from the moment a unit of labor is applied until it emerges as product. And, finally, it brings us back to the difficulty that the amount of capital must, if it includes an element of interest, vary according to the rate of interest: it must involve already the rate of interest which it is the problem to explain.

concept that he employs. What is it that goes roundabout in production when capital is used? According to Böhm-Bawerk's idea it is not the capital itself, but something that passes through and abides for a time in the capital. The capital, he says, is previous labor; or, correcting himself,* it is, more exactly, "stored up previously applied productive force, which can be not only labor, but also valuable natural forces or uses of land." Their value is thought of as originating or given off at a certain moment; and, evidently, it is this value, rather than the physical things, which goes a roundabout journey, and at length arrives at the goal of finished, enjoyable goods. The average production period must be the average time that elapses, throughout the industrial system, between the moment that a use of land originates and the moment it reaches its goal. Any valuable use of land that is not yet matured or available for present wants is a postponed or future value. Anything, such as a table or a house, that contains a number of these uses owes a part of its present value, therefore, to the capitalization or discounting of these future uses at a prevailing rate of discount. In this way the uses of land are made a part of the capital value of all things. Farms or mines have values due to the capitalization of the value of their uses; and this, by Böhm-Bawerk's admission, is just what constitutes any capital value. There is left no logical or consistent test to divide capital, as formally defined by Böhm-Bawerk, from those things which he would exclude from that concept.

If we put together these objections to the argument, we have it in this form: if it were true in any case, it would be true (1) only when the diminishing returns of natural agents did not offset it; (2) when the change in the amount of capital is not merely the expression of a change in the rate of interest; (3) when the increase does not represent accumulated interest or monopoly gains embodied in capital; and (4) when the increase is not the capitalization of the uses of natural agents. There is involved in Böhm-Bawerk's argument, therefore, the fallacy of an unsound premise. If all capital does not consist of, or owe its value to, previous labor, a false conclusion is drawn when the length of the production period is assumed

* *Einige strittige Fragen*, p. 11 and note.

to be fixed by the relation between the stock of capital, counted as previous labor, and the annual amount of labor. Arithmetical examples of the kind given by him * prove nothing as to the proposition advanced unless it can be shown that the increase in the capital represents labor only.

If the concepts of the roundabout process and of the average production period are so defective, and yet have obtained wide, currency, it must be because they contain a partial truth. In fact, the author at the outset transfers the reader's thought to the point from which the conceptions appear simple and reasonable. This may be better understood if we state the proposition as a hypothetical truth. If the value of capital consisted entirely of the value of labor, if the amount of capital varied directly with the "amount of labor" and with nothing else, if capital were distributed to the industries of longer and shorter processes in a fixed proportion, then every increase in the ratio of existing capital to current labor would represent an increase of the average period of labor between the application of labor and its fruition. But every one of the "ifs" is contrary to reality. The author states the proposition with all these conditions implied, makes, in a note, passing comment on its inexactness, fails to see how his general proposition is affected, and goes on to draw a conclusion.

Hasty and rough observation seems to support the proposition; for, taking the extreme cases, evidently a larger proportion of the efforts of men is applied to current wants in primitive society, while in a more advanced and richer society a larger proportion is embodied in durable agents. But, labor being only one of the factors entering into the amount of capital, the ratio of capital to current labor does not express at all exactly the length of "the roundabout process." The amount of capital varies as a function of several factors, of which labor is only one. Most important of the neglected factors is the rate of interest,—that is, the rate at which all of the existing rentals, no matter what their nature, shall be capitalized, and shall enter into the value expression of the stock of capital.

* *Positive Theory*, pp. 262, 266, 267, 269.

SECT. 4. FUTILITY OF THE CONCEPT OF AN "AVERAGE PRODUCTION PERIOD."

Were all the foregoing objections beside the mark, there still would remain a fundamental weakness in the conception of the average production period, unfitting it to bear any part in the solution of the theoretical interest problem. It involves the fallacy of averages. The production period, with Böhm-Bawerk, is not an average time in one industry, but an average period during which the value of the total productive force of the community is supposed to be embodied in the total existing body of capital.* Such an average of widely divergent facts is not the significant thing in the explanation of interest. The average production period, whose length is assumed to express the degree of roundaboutness of the productive process, is an average of a multitude of different productive processes of every conceivable length. In a great many industries the labor is said to mature almost immediately; in others, only after a long period. If at one time one-half of a given capital, and at a later time one-tenth, is employed in industries with a short-time period, the average productive period would be lengthened without any change in the amount of capital.

50 units in industries with 1 mo. period =	50 units for one month
50 " " " " 2 yrs. " =	1,200 " " " "
100 " average	12½ mos. production period.

In the second case we might have the following:—

10 units in industries with 1 mo. period =	10 units for one month
90 " " " " 2 yrs. " =	2,160 " " " "
100 " average	21.7 mos. production period.

The average production period for industry as a whole (even if it were correct to conceive of it as Böhm-Bawerk does) would have no logical relation to the productiveness of capital or to the rate of interest. What is significant is not the average period, but the marginal application. One cannot explain market price by an average of the subjective estimates of all the buyers and sellers. In any particular industry at any mo-

*See above, p. 168 note.

ment the use of more capital (value) may, perhaps, yield a larger product, either technical or economic; but this may even accompany a decrease of the average production period for industry as a whole, if the capital has been transferred from an industry with a longer production period to one with a shorter. Along the margin of possible uses the existing stock of capital is applied, equalizing thus the rate of interest in the different uses, and altering likewise the ratio of labor and capital invested. In determining this distribution, however, the average production period, as Böhm-Bawerk conceives of it, has no causal influence whatever. It is itself nothing but an arithmetical resultant of all the changes that have taken place. It is a figment of the same kind as the wage fund. A lengthening of the average productive period could therefore accompany as well a fall as a rise of the productiveness of capital.

It remains to mention the mathematical support for his proposition by which the author is himself misled. Taking up his final discussion of the roundabout process, he says: * "I venture to think we may now assume it as proved," and then he frames some arbitrary arithmetical tables "to represent the product which may be turned out by increasingly lengthy processes under the picture of a series increasing in a certain ratio, regular or irregular." In the first one he represents a month of labor in 1888, for that year producing 100 units; for 1890, producing 200; for 1892, producing 400, etc. Plainly, these figures add no proof whatever to the proposition, which, therefore, is in no way strengthened by the statement that, "whatever period of time we take as our standpoint of comparison, the earlier (present) amount of productive instruments is seen to be superior, technically, to the equally great later (future) amount." † When the author goes on to the further proposition, that technical superiority is accompanied by a superiority of value, he declares that it "may be made absolutely convincing by mathematical evidence." ‡ The "evidence," however, is merely another set of illustrative tables, arbitrarily constructed on the assumption of the truth of the proposition in question. Introduced with the statements quoted in the third line of this paragraph, they are dismissed with the remark: "on the single assump-

* *Positive Theory*, p. 260.

† *Ibid.*, p. 262.

‡ *Ibid.*, p. 264.

tion that longer methods of production lead generally to a greater product, it is a necessary result."*

SECT. 5. THE CAPITAL CONCEPT AS THE SOURCE OF ERROR.

The validity of the assumption being the question under consideration, we return from the mathematical evidence to the question of the greater productiveness of the roundabout process. Glancing back over the many difficulties in the author's argument, it appears that they may all be traced more or less clearly to the defects of his capital concept. In advance of his time, and presenting a twentieth-century theory of value, he has been content to use the clumsy eighteenth-century capital concept. This involves him in inconsistencies at every step. An advocate of the theory of marginal utility, he yet employs what is essentially a cost-of-production concept of capital, and, despite his various statements to the contrary, he is looking to the past rather than to the future of goods for an explanation of their value. It is "previous labor" and not future utility, regardless of the quantity, time, or value (however it may be measured), that distracts his attention, and fixes it on the figment of the average production period of industry as a whole. A value concept of capital, wherein capital is thought of as merely the present worth or capitalized value of the future uses of existing agents, makes the conception of the roundabout process appear fragmentary, inadequate, and false because only a half-truth. Almost immediately he is compelled to go over to the value concept of capital, for that is the only one that permits of the discussion of interest as a percentage of the principal. Thus at every step the two ideas conflict, a greater capital at one moment meaning more physical instruments, at another meaning durable instruments of greater value expressed in terms of present goods. Before beginning his task, Böhm-Bawerk has expressed the hope that he might give a solution of the problem of interest that "invents nothing and assumes nothing."† The conceptions of the average period of production and of the roundabout process appear to err both in inventing and assuming.

* *Positive Theory*, p. 268.

† *Capital and Interest*, p. 428.

SECT. 6. RELATION OF ROUNDABOUTNESS TO THE OTHER
 GROUNDS FOR THE HIGHER VALUATION OF PRESENT
 GOODS.

Our author says he considers that the "statement of how the productivity of capital works into and together with the other two grounds* of the higher valuation of present goods, is one of the most difficult points in the theory of interest and, at the same time, the one which must decide the fate of that theory."† There is a flaw in the argument at this crucial point. Foregoing a detailed criticism here, let us observe that the technical productiveness is not co-ordinate with the other causes assigned, and that the words "present wants" and "future wants" are used in the propositions in different senses. In the statement that present goods are worth more than future goods because of differences in wants and provision for wants, the present goods are objects which confer enjoyments or satisfactions at the present moment: the future goods are the same goods thought of as secured at a future moment. But, in the statement that present goods are technically more productive than future goods, the "present goods" are not "present enjoyments," but "intermediate goods," or "productive agents," to use the phrases elsewhere employed by Böhm-Bawerk. Whether they will mature physically and become enjoyable goods in the future, or whether they will merely permit the securing of future goods, in either case they may be said to represent rather future goods (enjoyments) than present goods in the sense of the other proposition. To identify the two things as present goods is entirely misleading. It would be a far more consistent use of language to call intermediate, or productive, agents "future goods" than present goods.

To Böhm-Bawerk these three reasons together seem to make a complete explanation. The first two reasons account for the agio on present over future consumption goods, the third accounts for the agio of present production over future production goods,—*i.e.*, those available at a later period. But there is only a mechanical or arithmetical completeness: there is

* Given above in note, p. 164.

† *Positive Theory*, p. 227, note.

no logical unity in the explanation.* A satisfactory theory of interest is not attained until time differences in all kinds of goods are traced back to a single principle. That principle is the greater want-satisfying power of present as compared with future consumption goods. The essence of the explanation must be found not in technical production, but in the subjective comparison of goods.

SECT. 7. THE WEAKNESS OF PRODUCTIVITY THEORIES.

It has been a surprise to many students of Böhm-Bawerk to find that he has presented a theory, the most prominent feature of which is the technical productiveness of roundabout processes. His criticism of the productivity theories of interest has been of such a nature as to lead to the belief that he utterly rejected them.† But evidently such is not the case. Critics have pretty generally agreed that the theory of the roundabout process is a productivity theory of interest; and it appears from Böhm-Bawerk's later statement that he does not object to the productivity theory as a partial, but as an exclusive, explanation of interest. He believes particularly that interest on consumption goods cannot be explained in that way. But he says repeatedly that the idea of the roundabout process contains the essential truth in the productivity theory, and he uses it to explain that part of interest yielded by produced goods employed in lengthened productive processes. Böhm-Bawerk's theory, therefore, so far as it rests upon the productiveness of roundabout processes, is a productivity theory; and as such it is to be judged by the tests which he has set up, and rightly, in criticising such an argument. The essence of the interest problem is to explain a surplus of value over the value of the capital employed.‡ It is not enough to show that more capital (or a more roundabout process) will produce more products, or to show that the aggregate of products has a greater value than those secured before. The value of the capital being derived from the value of the products, the more the

*The reader will recall the distinction between the action of the different causes, the first two being called cumulative, the second alternative. See *Positive Theory*, pp. 273-277.

† See *Capital and Interest*, e.g., pp. 111-119, 180, 181, and 138, quoted below.

‡ See *Capital and Interest*, e.g., pp. 116-118.

products (in value), the more the capital (value), unless the interest rate (the thing to be explained) keeps the capital from increasing proportionately.

In criticising others, Böhm-Bawerk has said:* "I grant that capital actually possesses the physical productivity ascribed to it. . . . But there is not one single feature in the whole circumstance to indicate that this greater amount of goods must be worth more than the capital consumed in its production; and it is this phenomenon of surplus value we have to explain." Now, coming to this explanation in his own positive argument,† he asks regarding the earlier productive instrument which he has shown to be technically superior: "But is it superior also in the height of its marginal utility and value? Certainly it is. For, if in every conceivable department of wants for the supply of which we may or shall employ it, it puts more means of satisfaction at our disposal, it must have a greater importance for our well-being." This argument curiously has involved in it the whole question; for, if the importance of the future use were, at the present moment, always greater than the present use, everything would be kept for the future. The reason why this is not done is that the future uses are discounted at the prevailing rate of interest. What we must demand at this point from the author, according to his own canons of criticism, is some proof that the greater technical product of the future has a greater value at this moment than the value of the capital consumed in it. This he quite fails to give. Instead, he says, after confessing that sometimes the opposite is the case: "For one and the same person at one and the same point of time the greater amount has always the greater value."‡ But the crucial question why the greater amount may have a less value at the present moment, when the two products are at two points of time, is not touched. The problem of interest is one that involves a ratio between the value of the capital and the value of the interest. The fact that the value of a given number of productive agents may be the same in any one of a dozen possible uses, though in some of them very long "roundabout processes" would give enormous sums of products and in others smaller amounts are

* *Capital and Interest*, p. 138.

† *Positive Theory*, p. 263.

‡ *Ibid*, p. 264.

at once secured, shows that the amount of technical product may diverge indefinitely from the value. Böhm-Bawerk has not bridged the gulf between the technical productivity and the surplus of value over the capital investment any better than those whom he has criticised.

SECT. 8. RELATION OF TECHNICAL PRODUCTIVITY TO THEORIES OF INTEREST.

If the foregoing is true, most of what is characteristic or significant in Böhm-Bawerk's *Positive Theory* must be rejected.* It must be said that he starts with brilliant intuitions into the true character of the interest problem, only to go astray on the road of the old productivity theory. Let us venture an opinion as to the nature of the difficulty and the direction that must be taken to reach a correct conclusion.

The initial error in the older theories of interest was mistaking the nature of the problem. Interest and rent were believed to be co-ordinate and essentially similar aspects of value, the difference lying in the kind of agents with which they were connected. Rent was thought to be due to the surplus value of the products of the soil, and interest in general to the surplus value of the products from capital. Böhm-Bawerk seems at many points of his earlier criticism ready to break away from this; but, in adopting the concept of capital that he employs, he made a correct solution of the problem impossible. He looks upon capital as consisting of certain *kinds* of agents, and of interest as the surplus value or product peculiar to those agents. Glimpses of a different view appear, but one which certainly falls far short of a correct one.†

Let us suggest the view that rent and interest are very dissimilar aspects of the value of goods. Rent has to do with "production" or scarce and desirable uses of things. To the interest theorist this is in the nature, one might almost say, of an

* After this article was in print the new edition of the *Positive Theory* came to hand. It proves, however, to be a *verbatim* reprint, not a revision of the first edition, the author's official duties having prevented his undertaking its rewriting at this time. This will be a source of much regret to economic students, although recent magazine articles by the author make it clear that he has in no essential way modified the concepts or theories presented in the first edition.

† E.g., *Positive Theory*, pp. 352-357.

ultimate fact. The interest theory begins with the valuation of these different rents or incomes, distributed through different periods of time. The "productiveness" of a material agent is merely its quality of giving a scarce and desirable service to men. To explain this service of goods is the essence of the theory of rent. Given this and a prospective series of future services, however, the problem of interest arises, which is essentially that of explaining the valuation set on the future uses contained in goods. Interest thus expressing the exchange ratio of present and future services or uses is not and cannot be confined to any class of goods: it exists wherever there is a future service. It is not dependent on the roundaboutness of the process; for it exists where there is no process whatever, if there be merely a postponement of the use for the briefest period. A good interest theory must develop the fertile suggestion of Böhm-Bawerk that the interest problem is not one of product, but of the exchange of product,—a suggestion he has not himself heeded. It must give a simple and unified explanation of time value wherever it is manifest. It must set in their true relation the theory of rent as the income from the use of goods in any given period, and interest as the *agio* or discount on goods of whatever sort, when compared throughout successive periods. For such a theory the critical work of Böhm-Bawerk was an indispensable condition; but, the more his positive theory is studied, the more evident it is that it has missed the goal.

FRANK A. FETTER.

CORNELL UNIVERSITY.